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3rd Annual Student Design Competition: Students showcase their design talents at the WEAO Conference

Rafiq Qutub, M.Eng., P.Eng., AECOM, Student Design Competition Sub-Committee Chair

The WEAO Student Design Competition (SDC) has become a regular part of the annual WEAO conference that features the talents of emerging young professionals. This year marks the third year where students participated in the competition that promotes 'real world' design experience for students interested in pursuing careers in the water environment industry.

This year's design challenge involved the conceptual and preliminary designs of expansion to the Acton Wastewater Treatment Plant (WWTP) in Halton Hills. The project was kindly provided by the Regional Municipality of Halton. The student teams were tasked to provide a preliminary design report complete with preliminary engineering drawings for the civil, mechanical and instrumentation works involved in their proposed expansions.

The Acton WWTP currently has an average capacity of 4,545 m³/day. The proposed expansion is to handle design flows of 5,600 m³/day by the year 2021 and 7,000 m³/day by 2031, to meet the ultimate build-out of the urban area. The treatment has to meet strict nutrient discharge limits to Black Creek, which is a designated cold water fishery.

Two teams participated: the University of Guelph and the University of Windsor. Team members attended a site visit in November 2010 to tour the facility and understand the existing operational challenges. The purpose of the exercise was to provide students with a 'real feel' of engineering in the real world, beyond what is taught in the classroom.

Each team had a consultant advisor from the industry and an academic advisor from their respective academic institution. The role of the advisors was to provide mentorship throughout the project. However, the students were fully responsible for producing their design and recommendations.

The competition was held on Sunday, April 10, 2011, in the afternoon prior to the conference ice breaker session. Three judges from the consulting industry and one from Halton Region evaluated the design reports and presentations. The judges were impressed by the quality of presentations and level of detail that both teams had provided in their submissions.

The University of Guelph won first place and the University of Windsor scored second place. Both teams will receive a one-year free WEF membership, in appreciation of their participation. The University of Guelph team will receive the financial sponsorship of WEAO to travel and participate in the upcoming SDC that will be part of the WEFTEC conference in Los Angeles in October.

WEAO is proud to have sponsored student teams over the past two years to compete at WEFTEC against the US teams that won at their respective Member Association level competitions. Ontario has made its mark at WEFTEC's SDC, as the Ontario team has scored second place overall in two consecutive years.

This year's SDC would not have succeeded without the dedication and support of many individuals. The SDC sub-committee would like to thank John Duong, Manager of Wastewater Planning, and Magda Bielawski, Project Manager

at Halton Region, for offering the project and providing the supporting information. Special thanks to Wendy Derjugin for offering the facility tour.

The SDC sub-committee would also like to acknowledge and thank the academic and consultant advisors for sharing their time and expertise with the participating students. Last, but certainly not least, special thanks to all the judges for evaluating the design submissions.

It has been an exciting competition this year, and the SDC sub-committee is in the process of preparing next year's competition.

Municipalities and consulting firms interested in offering projects or participating in evaluation or mentorship are welcome to contact Rafiq Qutub, the SDC sub-committee chair at Rafiq.Qutub@aecom.com.

We wish the University of Guelph team members all the best in their upcoming competition in Los Angeles. Stay tuned!

Academic and Consultant Advisors to the student teams

Team	Consultant Advisor	Academic Advisor
University of Guelph	Dave Arsenault, P.Eng., CH2M HILL	Hongde Zhou, PhD, P.Eng.
University of Windsor	Ansel Bather, P.Eng., AECOM	Rajesh Seth, PhD, P.Eng.

Judges for the third annual WEAO Student Design Competition

- John Duong, M.Eng., P.Eng., Manager, Wastewater Planning, Public Works, Halton Region
- Zhifei Hu, PhD, P.Eng., Project Manager, Environmental Infrastructure, Stantec
- Tim Constantine, M.Eng., P.Eng., Global Water Technology Lead, CH2M HILL
- Germana Nunes, M.Sc., P.E., Project Engineer, Black & Veatch Canada



Part of the facility tour of the Acton Wastewater Treatment Plant for the student design teams.



Front row (L-R) Judging Panel: Zhifei Hu, P.Eng., Stantec; Germana Nunes, P.E., Black & Veatch; Tim Constantine, P.Eng., CH2M HILL; and John Duong, P.Eng., Halton Region. Back row (L-R) Guelph team: Adam Erb, Cynthia Mason, Alexandra Chan and Julia Veerman. Windsor team: Priyanka Joshi, Amaka Ikeaka, Christy Ekpekedede and Maharshi Thakor.

Our WEAO Conference Experience: University of Guelph student team

The University of Guelph SDC Team

The University of Guelph is WEAO's 2011 Student Design Competition (SDC) champion. This year's SDC project was to design the expansion of the Acton Wastewater Treatment Plant. The facility expansion challenged us with many requirements, including meeting the stringent effluent criteria of discharging into Black Creek, a cold-water fishery, while accommodating the Halton Region's growing population.

We will now be taking our design to compete at the WEFTEC conference in Los Angeles this October. Looking back over the past semester's experience working on this project, we are very proud of our accomplishments and experiences, as a result of preparing for this competition. From our site visit at Acton's WWTP in December to the WEAO conference where we presented, everything has been a great learning experience for each of us. We are truly happy that we chose to be a part of this.

Our Guelph SDC team consists of four students who were completing their undergraduate studies this semester at the University of Guelph. Team members were Alexandra Chan, from Water Resources Engineering; Adam Erb, from Electrical Systems and Computing Engineering; and Cynthia Mason and Julia Veerman, from Environmental Engineering. Our team learned a lot in terms of both technical and soft skills. The consulting-style approach taken has especially given us excellent practical experience for our journeys beyond our undergrads and into the working world.

The site visit was a great opportunity to meet other students who had entered in the competition, to see the existing layout of the current facility first-hand, and to ask the facility staff lots of operational questions. After the site visit, our contact with the facility was minimal. Each team was provided limited data with regards to the existing infrastructure and the infrastructure required for expansion.

We were given a lot of allowance to research, make educated assumptions, and design.

The tertiary treatment system exposed us to a lot of different technologies that we had only touched upon in class. For our plant expansion, we designed a conventional plug flow reactor activated sludge tank that could be later upgraded to biological nutrient removal, chemical dosing systems, UV disinfection chambers, dual-stage anaerobic digesters, and SCADA systems, to name a few. Working independently on the project, without other classmates doing the same project, was also fun and challenging because of the amount of freedom we felt we had with our design.

We really enjoyed presenting at the 2011 WEAO conference in Toronto, talking with other competing students about the project, and meeting last year's winners. It was also interesting to see how others designed their expansions. The judges and audience challenged us with questions that tested our newly acquired knowledge. This was constructive and appreciated, because this feedback, along with speaking with the judges afterward, has much better prepared us for our presentation in October 2011 in Los Angeles.

Thankfully, the conference was scheduled in the early stages of our exams month. Although some of us had two exams on the Tuesday of the conference, we did not hesitate to set aside time to network with other new and established professionals. The conference was great! We met a lot of great people, had amazing food, and learned a great deal. Attending the conference was an invaluable experience for each of us, as it provided us with exposure to the industry that our undergrad could not. Moreover, the SDC was very well run from beginning to end. We look forward to attending future conferences to meet other professionals and students entered in design competitions.

It would not have been possible without the help of many people at WEAO. We would like to acknowledge Professor Hondge Zhou (faculty advisor), Dave Arsenault (consultant advisor, CH2M HILL), and Rafiq Qutub (SDC Chair), as well as Tim Constantine, John Duong, Zhifei Hu, and Germana Nunes (SDC judges). Also, thanks to everyone at the conference who provided us with words of wisdom for our future careers.



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